AGRICULTURAL NOTES.

THE annual report of the Transvaal Department of Agriculture for 1903–4 is a volume of more than 400 pages, which contains, in addition to an introduction by the director, reports on the fourteen sections into which the work of the department falls. In discussing the *personnel* of the department, the director refers to the difficulty of obtaining expert assistants, a difficulty which, so far as agriculture is concerned, exists in all countries supplied from Britain, and even in such countries as the United States, where the training of the expert receives more attention than it does here. Many of the chief positions in the Transvaal department have now been filled up, but assistants are still required, and as the work expands it is probable that a considerable number will be engaged. The report states that men for scientific work "will doubtless best be obtained from amongst students who have had good careers at one or other of the universities, and who have done a certain amount of research after taking their degree. A thorough grounding in pure science is a *sine qua non*, and if they are not acquainted with the applied side of Science, this knowledge will have to be acquired in our laboratories whilst acting as assistants to the Chief of their particular Division."

The above named report contains many interesting paragraphs. Here is one that appears under the heading "Farmers' Cooperative Experiment Reports":—From General Louis Botha, Pretoria, "They (mangels from England sent for trial by the Department) do not grow so quickly as other sorts of root-crops, but if sown early they will grow splendidly and give a good winter crop in May; therefore I ordered a big quantity which I intend to use this year."

In papers contributed to the first four parts of the *Agricultural Journal of the Cape of Good Hope* for the current year, Mr. D. E. Hutchins, conservator of forests at Cape Town, makes out a strong case for the extension of tree planting in South Africa. The coast districts have a very favourable climate, growth is rapid, and the quality of the timber produced is good; but while native resources have not been developed, timber to the value of 1½ millions is imported annually. There is no reason why most of the wood required for building and mining purposes should not be grown in the country, and it is estimated that every 1*l.* spent in afforesting suitable land would bring in an annual revenue of 1*l.* in thirty-five years' time! If Mr. Hutchins can convince the financier that this estimate is correct, South Africa should soon grow its own timber; but in this branch of agriculture the sower seldom reaps, and the investor is not easily convinced. It is likely, therefore, that in South Africa, as elsewhere, the lack of capital will prove a more serious difficulty to the enthusiastic forester than either soil or climate.

In a recent number of the *Bulletin of the College of Agriculture, Tokyo Imperial University*, there is an article of considerable interest to British agriculturists. The Japanese farmer, like the English farmer of half a century ago, is given to employing lime more freely than is good for his land, and in some districts the injury done by liming has caused the authorities to interfere with the practice. Following up some work by Kellner and Böttcher on the effects of lime on the action of certain phosphates, Nagaoka investigated the results of employing a number of phosphatic fertilisers on limed and on unlimed land. Rice was grown, and it was shown that lime greatly interfered with the action of those phosphatic manures which were of animal origin, such as bone meal or fish bones; on the other hand, when the phosphates were derived from a vegetable source, the effects of lime were not very pronounced. The injury was about twice as great in manures of animal as in those of vegetable origin. The injurious action of lime extended into a second year. Nagaoka's results confirm those obtained by Kellner and Böttcher in Germany, and indicate that such manures as bone meal and fish meal should not be used on recently limed soils.

We have received from the committee of the Lawes Agricultural Trust a copy of the report of the director, Mr. A. D. Hall, on the work done at the Rothamsted Experimental Station for the year ending March 31. The well known experimental fields are still continued without any essential change; in addition, a new field has been laid out to test the residual value of various manures in the second and succeeding years after their application. Other experiments deal with calcium cyanamide, the new manure containing nitrogen derived from the atmosphere, and with the various cultivations of bacteria which have been recently introduced for the inoculation of leguminous crops, with the view of making them more efficient collectors of atmospheric nitrogen. During the year in question seven papers have been issued from the station, all of which deal with investigations on the soil, methods of soil analysis, &c. The annual losses of carbonate of lime in the Rothamsted soil have been determined, both that due to natural agencies and that caused by the use of manures. Certain restorative actions have been investigated which account for the maintenance of the fertility of many soils which are almost devoid of lime. Another of the papers deals with the remarkable accumulations of fertility in certain plots of land which have been allowed to run wild for the last twenty years, and have in that time gained nitrogen to an extent not readily explicable by the accepted theories. The Lawes Trust committee continues to find its income very inadequate to the proper development of the station; only donations and subscriptions from various sources, including 300*l.* from the Goldsmiths' Company, 50*l.* from the Clothworkers' Company, 50*l.* from Lord Rothschild, &c., have prevented a serious deficit on the year's working. Mr. J. F. Mason has also promised to erect and equip a new laboratory for agricultural bacteriology, which will be the first of its kind in this country, as a continuance of the experiments carried on for many years by his father, the late Mr. James Mason, at Eynsham Hall, Oxon.

REPORTS ON SEA FISHERIES.

THE report for 1904 on the Lancashire Sea Fisheries Laboratory at the University of Liverpool and the sea fish hatchery at Piel[1] contains an introduction and general account of the year's work, written, as usual, by Prof. Herdman, the honorary director of the scientific work.

A report upon the sea fish hatchery at Piel, by Mr. Andrew Scott, shows that more than a million plaice fry and more than twelve million flounder fry were liberated, the result of hatching eggs laid by fish caught in the autumn and confined in tanks at the hatchery. The useful results to the fisheries of thus confining spawners and turning out the newly hatched fry have yet to be demonstrated.

A paper upon the tow-nettings collected in the Irish Sea, contributed by Mr. Scott, is of little value, because it is far too general, the contents of the tow-nets not having been identified. Such records as "Copepoda, medusoids, gelatinous algæ, a fish egg," are perhaps of some value, but of very little. It appears to us that had less been attempted, and some one group properly worked, the value of the paper would have been much greater. In referring to the occurrence of pelagic fish eggs, the scientific names of the various species might have been mentioned with advantage.

Bacteriological investigations in relation to shell-fish pollution by sewage matter, by Mr. James Johnstone, is an interesting paper continuing an investigation carried on during the previous year. Mr. Johnstone is also responsible for a paper upon plaice-marking experiments, and for another upon the internal parasites and diseased conditions of fishes. The plaice-marking experiments are upon a small scale, but no doubt will give results of interest in time. Dr. J. Travis Jenkins, recently appointed to the post of superintendent of fisheries of the district, contributes an interesting discussion of official fishery statistics, from which it appears that the Board of Trade returns are not always accurate. Dr. Jenkins's remarks

[1] Report or 1904 on the Lancashire Sea Fisheries Laboratory at University of Liverpool and the Sea-fish Hatchery at Piel; and Syllabu Lessons on Marine Biology. (Liverpool, 1905.

upon the cockle industry are both interesting and important.

The volume contains several plates and woodcuts, and is in paper covers. The education committee of the Lancashire County Council provided funds for the instruction of fishermen at the Piel hatchery, and forty-five fishermen attended the class which was held in the spring by Mr. James Johnstone. A "Syllabus of the Lessons in Marine Biology given in the Practical Classes for Fishermen" has been revised, and is now published as a separate volume. It is difficult to estimate the value to the fishermen of the benefit to be derived from a superficial knowledge of marine biology, but the value to the laboratory no doubt lies in the fact that the men send in specimens of animals and plants taken in the course of their fishing operations.

The Danish fishery and hydrographical contributions to the international North Sea fisheries investigations,[1] lately issued, include two papers dealing with fishery matters, one by Mr. Johs. Schmidt being concerned with the pelagic post-larval stages of the two species of halibut *Hippoglossus vulgaris*, Flem., and *H. hippoglossöides* (Walb.). Mr. Schmidt points out that the best distinction between these two species is not in the number of fin-rays, but in the number of vertebræ, and he found certain post-larval fishes off Iceland and the Færöe Islands which agreed in the number of vertebræ with the adults of *H. vulgaris*. The material from which he determined the young stages of *H. hippoglossöides* was taken by the Danish Ingolf Expedition.

The other fishery paper is by Dr. A. C. Johansen, and is entitled "Contributions to the Biology of the Plaice with Special Regard to the Danish Plaice Fishery," and is the first report published upon the subject. The paper is exceedingly interesting, the results, chiefly in regard to the growth and migrations of the plaice, having been obtained by recording the length of a number of fish, marking them with a label, and returning them to the sea to be caught later on by one of the numerous fishing boats. A fair percentage of the fish have been recovered, and by re-measuring these fish their rate of growth during the time between their marking and re-capture has been determined. An interesting part of this experiment was the transplanting of fish from one ground to another, by which it was found that on some grounds they would grow three or four times as rapidly as upon other grounds. Experiments upon the same lines have been carried out by the English staff with similar results, but the official English report is not yet published. The marking experiments have also shown that in Danish waters there are decided migrations of plaice at different times of the year, the tendency being for the fish to work into shallower water during the spring and into deeper water during the autumn.

Dr. Martin Knudsen contributes a paper upon the hydrography of the North Atlantic Ocean, while Mr. J. N. Nielsen writes upon the hydrography of the waters of the Færöe Islands and Iceland during 1903. In both these papers we should have liked to see either an introduction stating the objects of the investigation or a summary of results, as, to those who are not hydrographers, the results obtained are not very clearly set forth. It is perhaps too early to attempt to connect the observed physical phenomena with the movements of the fish, but no doubt, as more material comes to hand, the biological results of the international investigations will be shown to be closely dependent upon the physical conditions observed by the hydrographical staff.

A paper by Mr. Neils Bjerrum, on the determination of oxygen in sea-water, is bound in with Mr. Nielsen's paper already referred to. Mr. Bjerrum has adopted a method of "preserving" the water samples taken in mid-ocean until they can be accurately analysed on land, and it appears that his method of adding to the water samples a solution of manganous chloride and caustic soda containing iodide of potassium has been very satisfactory.

FRANK BALFOUR BROWNE.

[1] Meddelelser fra Kommissionen for Havundersøgelser. (Copenhagen, 1904-5.)

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—A statute was brought before Congregation on June 6 to provide a delegacy to superintend the instruction of candidates for the Indian Forest Service, and to grant diplomas in forestry. The proposal to establish a diploma in forestry in the university has arisen from the recent decision of the Secretary of State for India to send the Indian forestry students, hitherto trained at the Coopers Hill Engineering College, to receive their special training in forestry at Oxford. Those students under the regulations just issued by the India Office will be selected by a competitive examination held by the Civil Service examiners every summer. They must be natural born British subjects of not less than eighteen or more than twenty years of age on the January 1 before their selection. They will be required, before becoming candidates, to have passed Responsions or an equivalent examination. The subjects of the competitive examination will be:—(1) mechanics and physics; (2) chemistry; (3) zoology; (4) botany.

After selection the students will be probationers for about three years. For the first two years they will be required to study at Oxford, and their course will include theoretical and practical forestry, and subjects auxiliary to forestry, viz. organic chemistry and the chemistry of soils, geology, forest botany, forest entomology, mathematics, German, and book-keeping. During the third year of probation they will receive practical instruction, visiting Continental forests under suitable supervision. The first competitive examination will be held on August 29 for the selection of not less than nine candidates. Applications for admission must be made to the India Office by July 1.

The Junior Scientific Club gave a conversazione in the museum on Tuesday, May 30, at which more than a thousand visitors were present. Lectures and demonstrations were given by Prof. Poulton, Dr. Tutton, Dr. Brereton Baker, and Mr. E. P. Poulton, and there were a large number of scientific exhibits.

The Robert Boyle lecture for 1905 was given by Sir Victor Horsley on Monday, June 5, in New College Hall. The subject of the lecture was "The Cerebellum."

CAMBRIDGE.—A little pamphlet has just been published on the authority of the Vice-Chancellor containing the names of all those who voted on the report of the examinations and the way they voted. An analysis of the poll shows that amongst the resident members of the university 288 voted in favour of allowing a substitute for Greek in the previous examination and 240 against. Thus the residents had, out of a total of 528 votes, the substantial majority of 48; they were, however, swamped by the non-resident vote. Only four colleges, King's, Christ's, Trinity, and Downing, showed a majority amongst both residents and non-residents in favour of the proposed change.

Prof. Lewis gives notice that a course of lectures and demonstrations in crystallography will be given in the mineralogical lecture-room during the long vacation, beginning at 9 a.m. on Friday, July 7.

The observatory syndicate has reported upon the management of the sum of 5000*l.* bequeathed by the late Mr. Frank McClean for "improving the instrumental equipment of the Newall Observatory." It recommends that the sum be invested, and that the disposal of both the interest and, if advisable, the capital, be in the hands of the syndicate, and that the accounts be annually audited and published with the university accounts.

The special board of medicine has drafted ordinances which, if they pass the Senate, will allow a candidate for the M.B. or M.D., if resident abroad, to take his degree *in absentia*.

THE annual conversazione of University College, London, will be held on the evening of Wednesday, June 28. There will be scientific and other exhibits illustrating the work of the various departments of the college.